Serial No.: 10/531,208

Docket No.: 28955.1048

IN THE CLAIMS:

(Previously Presented) A photoresist base material consisting essentially of an extreme ultra-violet reactive organic compound represented by the following general formula
 (1),

wherein A is an organic group selected from the group consisting of

wherein each of B, C and D is independently an extreme ultra-violet reactive group, a group having reactivity to the action of chromophore active to extreme ultra-violet or an organic group selected from the group consisting of

$$A_{1} \longrightarrow A_{1} \longrightarrow A_{1$$

wherein Ar is a phenyl or naphthyl group substituted with RO- and/or ROCO- in which R, RO- and ROCO are extreme ultra-violet reactive groups or groups having reactivity to the

action of a chromophore active to extreme ultra-violet,

wherein each of X, Y and Z is independently a single bond or an ether bond, and 1 + m + n = 2, 3, 4 or 8.

- 2. (Original) The photoresist base material as recited in claim 1, wherein said extreme ultra-violet reactive organic compound is in an amorphous state at room temperature and has a molecule whose average diameter is 2 nm or less.
- 3. (Previously Presented) The photoresist base material as recited in claim 1, wherein A is an organic group selected from the group consisting of

wherein each of B, C and D is selected from the group consisting of a hydrogen atom, tert-butyl, tert-butyloxycarbonylmethyl, tert-butyloxycarbonyl, 1-tetrahydropyranyl, 1-tetrahydrofuranyl, 1-ethoxyethyl, 1-phenoxyethyl, an organic group represented by

$$-\left(\begin{array}{c} H_2 \\ C \end{array}\right)_S P - \left(\begin{array}{c} O \\ O - C - O - Q \end{array}\right)_r$$

wherein P is an aromatic group having a valence of (r + 1) and having 6 to 20 carbon atoms, Q is an organic group having 4 to 30 carbon atoms, r is an integer of 1 to 10 and s is an integer of 0 to 10,

and an organic group selected from the group consisting of

wherein Ar is a phenyl or naphthyl group substituted with RO- and/or ROCO- in which R is selected from the group consisting of hydrogen, tert-butyl, tert-butyloxycarbonylmethyl, tert-butyloxycarbonyl, 1-tetrahydropyranyl, 1-tetrahydrofuranyl, 1-ethoxyethyl, 1-phenoxyethyl and an organic group represented by

$$\frac{H_2}{C} \xrightarrow{S} P \left(O - C - O - Q \right)_r$$

wherein P is an aromatic group having a valence of (r + 1) and having 6 to 20 carbon atoms, Q is an organic group having 4 to 30 carbon atoms, r is an integer of 1 to 10 and s is an integer of 0 to 10,

and each of X, Y and Z is independently a single bond or an ether bond.

4. (Previously Presented) The photoresist base material as recited in claim 3, wherein A is an organic group represented by

wherein each of B, C and D is selected from the group consisting of a hydrogen atom, tert-butyl, tert-butyloxycarbonylmethyl, tert-butyloxycarbonyl, 1-tetrahydropyranyl, 1-tetrahydrofuranyl, 1-ethoxyethyl, 1-phenoxyethyl and an organic group represented by

$$\frac{H_2}{C} \xrightarrow{P} P \left(O - C - O - Q \right)_r$$

wherein P is an aromatic group having a valence of (r + 1) and having 6 to 20 carbon atoms, Q is an organic group having 4 to 30 carbon atoms, r is an integer of 1 to 10 and s is an integer of 0 to 10,

and X, Y and Z are ether bonds.

5. (Previously Presented) A photoresist base material consisting essentially of a radiation-sensitive organic compound represented by the following general formula (1),

$$\begin{pmatrix}
C
\end{pmatrix}_{m}^{A}
\begin{pmatrix}
Z
\end{pmatrix}_{D}$$
(1)

wherein A is an organic group represented by

wherein each of B, C and D is independently selected from the group consisting of tertbutyloxycarbonylmethyl, tert-butyloxycarbonyl and an organic group represented by

$$\begin{array}{c} -\left(\begin{array}{c} H_2 \\ C \end{array}\right)_S P - \left(\begin{array}{c} O \\ O - C - O - Q \end{array}\right)_r$$

wherein P is an aromatic group having a valence of (r + 1) and having 6 to 20 carbon atoms, Q is an organic group having 4 to 30 carbon atoms, r is an integer of 1 to 10 and s is an integer of 0 to 10,

each of X, Y and Z is independently a single bond or an ether bond, and 1 + m + n = 3.

6. (Original) The photoresist base material as recited in claim 5, wherein the organic group represented by

$$\frac{\left(\begin{array}{c} H_2 \\ C \end{array}\right)_S P \left(\begin{array}{c} O \\ O - C - O - Q \end{array}\right)_r$$

is 4-(tert-butoxycarbonyloxy)benzyl or 3,5-di(tert-butoxycarbonyloxy)benzyl.

- 7. (Original) The photoresist base material as recited in claim 5, wherein the radiation is extreme ultra-violet or electron beam.
- 8. (Previously Presented) The photoresist base material as recited in claim 1, wherein at least one of B, C and D is a hydrogen atom and X, Y and Z are ether bonds.
- 9. (Previously Presented) The photoresist base material as recited in claim 1, which has a basic impurity content of 10 ppm or less.
- 10. (Previously Presented) A photoresist composition comprising a solid content containing the photoresist base material recited in claim 1 and a solvent.
- 11. (Original) A photoresist composition comprising a solid content containing the photoresist base material recited in claim 9 and a solvent.

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12. (Original) The photoresist composition as recited in claim 10, which further comprises an optically-acid-generating agent.

13. (Original) A method for purification of a photoresist base material, which comprises washing the photoresist base material recited in claim 1 with an acidic aqueous solution and treating the material with an ion-exchange resin.

- 14. (Previously Presented) The method for purification of a photoresist base material as recited in claim 13, wherein said acidic aqueous solution is an acetic acid aqueous solution.
- 15. (Previously Presented) A method for improvement of the photoresist base material recited in claim 1 in radiation sensitivity, which comprises decreasing the content of basic impurities to 10 ppm or less.
- 16. (Previously Presented) A method for fine processing by lithography, which uses the photoresist composition recited in claim 10.
- 17. (Previously Presented) A semiconductor device fabricated using the photoresist composition recited in claim 10.
 - 18. (Cancelled)

19. (Previously Presented) The organic compound as recited in claim 21 or 22, which has a basic impurity content of 10 ppm or less.

- 20. (Previously Presented) A method for purification of an organic compound, which comprises washing the organic compound recited in claim 21 or 22 with an acidic aqueous solution and treating the compound with an ion-exchange resin.
- 21. (Previously Presented) An organic compound represented by the following general formula (1),

$$\begin{pmatrix}
C
\end{pmatrix}_{m}^{A}
\begin{pmatrix}
Z
\end{pmatrix}_{n}$$
(1)

wherein A is an organic group represented by

wherein each of B, C and D is independently an organic group represented by

$$\frac{H_2}{C} \rightarrow P + \left(O - C - O - Q\right)_r$$

wherein P is an aromatic group having a valence of (r + 1) and having 6 to 20 carbon atoms, Q is an organic group having 4 to 30 carbon atoms, r is an integer of 1 to 10 and s is an integer of 0 to 10,

each of X, Y and Z is independently a single bond or an ether bond, and 1 + m + n = 3;

provided that excluded is the organic compound represented as follows

22. (Previously presented) An organic compound represented by the following general formula (1),

$$\begin{pmatrix}
C
\end{pmatrix}_{m} \begin{pmatrix}
X
\end{pmatrix}_{m} \begin{pmatrix}
Z
\end{pmatrix}_{n}$$
(1)

wherein A is an organic group represented by

wherein each of B, C and D is independently an organic group represented by

wherein P is an aromatic group having a valence of (r + 1) and having 6 to 20 carbon atoms, Q is an organic group having 4 to 30 carbon atoms, r is an integer of 1 to 10 and s is an integer of 0 to 10,

each of X, Y and Z is independently a single bond or an ether bond, and 1 + m + n = 8.

23. (Previously presented) The organic compound as recited in claim 21 or 22, wherein the organic group represented by

$$\frac{H_2}{C} \xrightarrow{S} P + \left(O - C - O - Q\right)_r$$

is 4-(tert-butoxycarbonyloxy)benzyl or 3,5-di(tert-butoxycarbonyloxy)benzyl.

24. (Previously presented) A photoresist base material comprising an extreme ultraviolet reactive organic compound represented by the following general formula (1),

$$\begin{pmatrix}
C
\end{pmatrix}_{m}^{A}
\begin{pmatrix}
Z
\end{pmatrix}_{D}$$
(1)

wherein A is an organic group selected from the group consisting of

wherein each of B, C and D is independently an extreme ultra-violet reactive group selected from the group consisting of

wherein Ar is a phenyl or naphthyl group substituted with RO- and/or ROCO- in which R, RO- and ROCO are extreme ultra-violet reactive groups or groups having reactivity to the action of a chromophore active to extreme ultra-violet,

wherein each of X, Y and Z is independently a single bond or an ether bond, and 1 + m + n = 2, 3 or 4;

provided that excluded is the organic compound represented as follows

25. (Previously Presented) A photoresist base material comprising an extreme ultraviolet reactive organic compound represented by the following general formula (1),

$$\begin{pmatrix}
A \\
C
\end{pmatrix}_{m}
\begin{pmatrix}
A \\
Z \\
D
\end{pmatrix}_{n}$$
(1)

wherein A is an organic group represented by

wherein each of B, C and D is selected from the group consisting of tert-butyl, 1-tetrahydrofuranyl, 1-ethoxyethyl, 1-phenoxyethyl, an organic group represented by

$$\begin{array}{c} \begin{array}{c} \begin{array}{c} H_2 \\ C \end{array} \end{array} \begin{array}{c} P \\ S \end{array} \begin{array}{c} O \\ O \\ C \end{array} \begin{array}{c} O \\ O \\ C \end{array} \begin{array}{c} O \\ O \\ C \end{array} \begin{array}{c} O \\ O \end{array} \begin{array}{c} O \\ O \\ C \end{array} \begin{array}{c} O \\ O \end{array} \begin{array}{c} O \\ O \\ O \end{array} \begin{array}{c} O$$

wherein P is an aromatic group having a valence of (r + 1) and having 6 to 20 carbon atoms, Q is an organic group having 4 to 30 carbon atoms, r is an integer of 1 to 10 and s is an integer of 0 to 10,

and an organic group selected from the group consisting of

$$A_1 - A_1 - CH_2 - A_1 - A_1$$

wherein Ar is a phenyl or naphthyl group substituted with RO- and/or ROCO- in which R is selected from the group consisting of tert-butyl, tert-butyloxycarbonylmethyl, tert-butyloxycarbonyl, 1-tetrahydropyranyl, 1-tetrahydrofuranyl, 1-ethoxyethyl, 1-phenoxyethyl and an organic group represented by

$$\frac{H_2}{C} \xrightarrow{S} P - \left(O - C - O - Q\right)_r$$

wherein P is an aromatic group having a valence of (r + 1) and having 6 to 20 carbon atoms, Q is an organic group having 4 to 30 carbon atoms, r is an integer of 1 to 10 and s is an integer of 0 to 10,

and wherein each of X, Y and Z is independently a single bond or an ether bond, and 1 + m + n = 8.

26. (Previously Presented) A photoresist base material consisting essentially of an extreme ultra-violet reactive organic compound represented by the following general formula (1),

$$\begin{pmatrix}
C
\end{pmatrix}_{m}
\begin{pmatrix}
C
\end{pmatrix}_{m}
\begin{pmatrix}
C
\end{pmatrix}_{n}$$
(1)

wherein A is an organic group represented by

wherein each of B, C and D is selected from the group consisting of tert-butyl, 1-tetrahydropyranyl, 1-tetrahydrofuranyl, 1-ethoxyethyl, 1-phenoxyethyl, an organic group represented by

$$\begin{array}{c} \begin{array}{c} \begin{array}{c} H_2 \\ C \end{array} \end{array} P \left(\begin{array}{c} O \\ C \end{array} \right)_S P \left(\begin{array}{c} O \\ C \end{array} \right)_r \end{array}$$

wherein P is an aromatic group having a valence of (r + 1) and having 6 to 20 carbon atoms, Q is an organic group having 4 to 30 carbon atoms, r is an integer of 1 to 10 and s is an integer of 0 to 10,

and an organic group selected from the group consisting of

$$A_1 - A_1 - CH_2 - A_1 - A_1$$

wherein Ar is a phenyl or naphthyl group substituted with RO- and/or ROCO- in which R is selected from the group consisting of tert-butyl, tert-butyloxycarbonylmethyl, tert-butyloxycarbonyl, 1-tetrahydropyranyl, 1-tetrahydrofuranyl, 1-ethoxyethyl, 1-phenoxyethyl and an organic group represented by

$$\frac{H_2}{C} = \left\{ \begin{array}{c} O \\ O \\ S \end{array} \right\} P = \left\{ \begin{array}{c} O \\ O \\ C \end{array} \right\} P = \left\{ \begin{array}{c}$$

wherein P is an aromatic group having a valence of (r + 1) and having 6 to 20 carbon atoms, Q is an organic group having 4 to 30 carbon atoms, r is an integer of 1 to 10 and s is an integer of 0 to 10,

and wherein each of X, Y and Z is independently a single bond or an ether bond, and l+m+n=8.

27. (Previously Presented) A photoresist base material comprising an extreme ultraviolet reactive organic compound represented by the following general formula (1),

$$\begin{pmatrix}
C
\end{pmatrix}_{m}^{A}
\begin{pmatrix}
Z
\end{pmatrix}_{D}$$
(1)

wherein A is an organic group represented by

wherein each of B, C and D is selected from the group consisting of tert-butyl, tert-butyloxycarbonylmethyl, tert-butyloxycarbonyl, 1-tetrahydropyranyl, 1-tetrahydrofuranyl, 1-ethoxyethyl, 1-phenoxyethyl,

and an organic group selected from the group consisting of

$$A_1 - A_1 - CH_2 - A_1 - A_1$$

wherein Ar is a phenyl or naphthyl group substituted with RO- and/or ROCO- in which R is selected from the group consisting of hydrogen, tert-butyloxycarbonylmethyl, 1-tetrahydrofuranyl, 1-phenoxyethyl and an organic group represented by

$$-\left(\begin{array}{c} H_2 \\ C \end{array}\right)_S P - \left(\begin{array}{c} O \\ II \\ O - C - O - Q \end{array}\right)_T$$

wherein P is an aromatic group having a valence of (r + 1) and having 6 to 20 carbon atoms, Q is an organic group having 4 to 30 carbon atoms, r is an integer of 1 to 10 and s is an integer of 0 to 10,

and wherein each of X, Y and Z is independently a single bond or an ether bond, and 1 + m + n = 2.

28. (Previously Presented) A photoresist base material consisting essentially of an extreme ultra-violet reactive organic compound represented by the following general formula (1),

$$\begin{pmatrix}
C
\end{pmatrix}_{m}
\begin{pmatrix}
C
\end{pmatrix}_{m}
\begin{pmatrix}
C
\end{pmatrix}_{n}
C
\end{pmatrix}_{n}
\begin{pmatrix}
C
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C
C$$

wherein A is an organic group represented by

wherein each of B, C and D is an organic group represented by

$$\frac{H_2}{C} = P + \left(O - C - O - Q \right)_r$$

wherein P is an aromatic group having a valence of (r + 1) and having 6 to 20 carbon atoms, Q is an organic group having 4 to 30 carbon atoms, r is an integer of 1 to 10 and s is an integer of 0 to 10,

each of X, Y and Z is independently a single bond or an ether bond, and 1 + m + n = 8.

29. (Cancelled)

- 30. (Previously Presented) A photoresist composition comprising a solid content containing the photoresist base material recited in claim 5 and a solvent.
- 31. (Previously Presented) A photoresist composition comprising a solid content containing the photoresist base material recited in claim 24 and a solvent.

32. (Previously Presented) A photoresist composition comprising a solid content containing the photoresist base material recited in claim 25 and a solvent.

- 33. (Previously Presented) A photoresist composition comprising a solid content containing the photoresist base material recited in claim 26 and a solvent.
- 34. (Previously Presented) A photoresist composition comprising a solid content containing the photoresist base material recited in claim 27 and a solvent.
- 35. (Previously Presented) A photoresist composition comprising a solid content containing the photoresist base material recited in claim 28 and a solvent.